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HON. RALPH FERGUSON, M.P.
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HOUSE OF COMMONS
CANADA

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September 24, 1991

The Honourable William K. Reilly
Administrator
Environmental Protection Agency
401 M. Street, SW
WASHINGTON, D.C. 20460

Dear Mr. Reilly:

I am writing you with concern over an application before your agency to allow a compound called MMT (Methylcyclopentadienyl Manganese Tricarbonyl) to be added to gasoline in the United States.

It is my understanding that the corporation who has sponsored this application, Ethyl Corp., basing a good part of its case on the "Canadian experience". However, in spite of Ethyl's claims to the contrary, significant and growing opposition to the use of MMT in gasoline in Canada exists. As you are undoubtedly aware, some of the leading research conducted on the issue of the effects of this heavy metal, and its third valence form, has been undertaken by Canadian researchers such as Dr. John Donaldson and Dr. Frank Labella.

As concern over the possible effects of adding MMT to gasoline have become known, several individuals who have had high exposures to unleaded gasoline have come forward publicly calling for a full examination of the effects of this heavy metal.

The Leader of the Liberal Party of Canada, and Her Majesty's Loyal Official Opposition, in an open letter to the Minister of Health and Welfare, dated April 17, 1991 stated "I respectfully ask that you take immediate action and ban the use of MMT in Canada to protect the lives of our people, especially our children, who are most vulnerable."

Radio stations have undertaken public information campaign and have assisted in the petition drive to ban MMT.

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My colleagues and I have tabled petitions containing close to 10,000 names in our Parliament, calling on the current government to ban MMT.

I have introduced a private members bill, to ban MMT and to require that gasoline in Canada have a minimum oxygen content of 3.2% as an environmental measure.

Cathy Cooper of the Canadian Environmental Law Association has called on the Canadian government to ban MMT stating:

> "Manganese is a heavy metal similar to lead, so MMT is also of concern to us. The health effects of manganese are very similar to lead and its wrong to continue to substitute one heavy metal for another."

I have enclosed copies of some of the press coverage that the question of banning MMT in Canada has created over the past two years. In addition to the material enclosed, there have also been several television broadcasts questioning the wisdom of allowing yet another heavy metal in our gasoline.

Ethyl corporation has also circulated a document entitled "Facts about MMT in Canada" which does not stand up to scrutiny. For example, on page 2 paragraph 5 Ethyl states "the product has been evaluated on an on going basis by...automobile manufacturers"

The product has been evaluated by automobile manufacturers as Ethyl states, however what Ethyl does not state is that Mercedes Benz and General Motors, have written Transport Canada asking for the elimination of MMT in unlead gasoline in Canada. (enclosed)

Furthermore, at the June 1990 hearing before your agency, Ms. Mary Smith, Director, Field Operations and Support Division, mentions a Ford paper expressing concern over the catalysts plugging, and mention that there is another, (un-named) manufacturer who has expressed concern about plugging. (page 104) Thus, at least three, maybe four companies have raised concerns over the use of MMT in Canada.

It is on this type of selectivity that Ethyl bases its arguments concerning the "Canadian Experience".

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I urge you to examine the "evidence of the Canadian experience" in detail. You will find that in many cases, covering many aspects of the use of MMT in gasoline, the prerequisite research has not been done. The government of Canada has been flying blind in allowing the use of this additive, and continues to fly blind in continuing to claim that it has no concern over possible health risks associated with its use, as my enclosed correspondence to the Minister of Health and Welfare documents.

I implore you to consider the full Canadian experience -- that the allowing the use of this additive, which one researcher has termed an "insidious neurotoxin" is of grave national concern.

Yours truly,

Ralph Ferguson

Hon. Ralph Ferguson, MP
Lambton-Middlesex

enclosed

Press clippings on MMT
Press clipping re: Davis Halleran, Karel Kraan
CBC RADIO Programs on MMT
Correspondence to Minister of Health and Welfare
Correspondence to Department of Transport from G.M., & Mercedes Benz

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OTTAWA, Canada
September 17, 1991

Hon. Benoit Bouchard, P.C., M.P.
Minister of Health and Welfare
325 East Block

Dear Mr. Minister:

Thank you for your letter of August 6, 1991 regarding MMT.

I have written the Department of Health and Welfare twice on the issue of MMT, pointing out the considerable volume of evidence suggesting the very real possibility that it constitutes a serious health risks, but to no avail.

As a result, I have decided to make this, and our past correspondence public, just so Canadians will be aware of the refusal of your department to take possible risks to their health seriously, instead choosing to side with a powerful U.S. corporation.

As you referred to the recent United States Environmental Protection Agency workshop, I thought I would wait until after I received documentation from that work shop to respond to your letter, as Deborah Rice and Grace Woods of your department were in attendance at the conference. Having received that documentation, there are few further points I wish to raise.

The June issue of the Canadian Medical Association reported that among infants aged 10 to 14 months of low income families in Montreal 24.3% had iron deficiency anemia. This statistic, although alarming in itself, becomes far more chilling in light of the findings of Michael and Judy Aschner of the Albany Medical College who presented finding to the conference, that manganese intake in the brains of laboratory rats who were iron deficient, increased significantly.

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Has your department examined this study, and its implications in view of the Canadian Medical Associations June report?

Another point of issue, arising out of the conference is the fact that Ethyl's application for permission to add MMT to U.S. gasoline (32 mg/ U.S. gallon) is for only half as much as is currently allowed in Canada, (66 mg/ U.S. gallon). Has your department made any enquiries as to why the difference?

This is not the only difference in figures the EPA conference revealed. The EPA found that as much as 60% of the manganese burned was emitted, or as much as 1.1 mg per mile. This contrasts sharply with Ethyl's claim "a current model automobile fuelled with the additive would release about 0.06 grams of manganese to the ambient air on an annual basis or only about 0.5 grams of manganese over the course of 100 thousand miles of vehicle operations " (EPA testimony Dr. Ter Harr of Ethyl, June 22, 1990) which is 0.005 mg/ml (500 ml/100,000 ml) of the manganese added to the fuel. Ethyl's tests are 20 times lower than the EPA's low range result of 0.1 mg/mile and 220 times lower than the EPA's high test result.

Thus, I worry when Health and Welfare cites Ethyl's data on air quality studies with such confidence in view of both the obvious conflict of interest, Ethyl's past claims concerning the health risk of tetraethyl lead and now the vast difference between Ethyl's emission test results and the EPA's.

In terms of the monitoring of air quality, I am pleased to see that your officials finally realize the concentrations at monitoring stations were lower than the actual levels to which people were exposed to the sources of emissions. To that end, I would ask, if Health and Welfare Canada will undertake one of the studies recommended at the EPA conference, that "Mn levels in various microenvironments (such as parking and personal garages, street canyons ect.) should be measured at selected Canadian sites." or will you be leaving this too solely to studies provided by the corporate sector?

In view of claims by individuals who claim to be suffering from ailments related to MMT, and exhibiting symptoms similar to Parkinson's and Hunting disease is Health and Welfare conducting any research on these claims? I believe if we are going to study the possible causes, we should study the effects as well.

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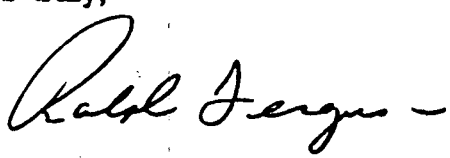
With reference to your comments regarding lead. It is not the orale intake of manganese that is of concern, but its inhalation. The parallel refers not to the manner of poisoning, but to government inaction for close to 10 years, after concerns relating to the adverse health effects of burning lead in gasoline were first raised. The point is for Health and Welfare not to wait, ten years, yet again, before acting to protect Canadians from a serious potential health risk, whose continuation in view of alternate technology is not required.

Thus, I again ask, has Health and Welfare studied the health effects of inhaling the third valency of manganese (Mn3) when it reached the conclusion that Mn3 emissions from MMT present no health risk to Canada?

Finally, has Health and Welfare examined the material presented by Louis Gottschalk of the University of California, Irvine, at the EPA conference on the association of manganese with violent behaviour, based on the study he and his associates conducted which found significantly elevated manganese levels in the hair of violent versus non-violent offenders. If this is the case, one has to wonder if it could be an environmental explanation for the increased level of urban violence in Canada's cities.

In view of all of the above, my past correspondence, the testimony presented to the U.S. EPA and the mounting scientific evidence I cannot understand why the Department of Health continues to defend the interests of a huge U.S. corporation, instead of defending the health of our Canadian people, particularly our children, whose immune systems are not yet in place.

Yours truly,



Hon. Ralph Ferguson, MP
Lambton-Middlesex

Minister of National Health and Welfare

CANADA

Ministre de la Santé nationale et du Bien-être social

6 VIII 1991

The Honourable Ralph Ferguson, P.C., M.P.
Lambton-Middlesex
House of Commons
Ottawa, Ontario
K1A 0A6

Dear Mr. Ferguson:

Thank you for your letter of June 14, 1991, concerning MMT.

Officials of my Department inform me that the most current scientific information continues to suggest that there is little health risk associated with the use of the octane enhancer, MMT. This evidence has been derived from studies of workers occupationally exposed to a mixture of manganese oxides, and from assessments of very low exposure to MMT combustion products. In this regard, it is important to note that even the most toxic chemical in the world is only a human health hazard if there is significant exposure to it.

At a recent United States Environmental Protection Agency workshop, attended by my officials, the two most important research needs identified by health experts concerning MMT were the need for improved data on exposure, and the need for comparative data on absorption and metabolism of the various valence states of manganese through both the oral and the inhalation routes of exposure.

With regard to exposure, it has not been possible to detect any change in average airborne manganese levels resulting from increased MMT use in Canada since 1982. In fact, this is in marked contrast to lead, where the drop in air lead concentrations, as tetraethyl lead was phased out, was very obvious. However, my officials advise me that, until recently, manganese measurements were obtained only by the standard air monitoring network set up by Environment Canada and a similar network of the Ontario Ministry of the Environment. The possibility, therefore, exists that average concentrations measured at these air monitoring stations were lower than the actual levels to which people were exposed closer to the source of emissions (i.e., on the street, in parking garages, and in other special situations).

.../2

In your letter, you refer to two studies conducted to measure exposure to MMT. It should be noted that both of these studies were designed to help remedy the data gap referred to above. The first study was carried out in Toronto in February, 1991, by Ethyl Corporation, Inc. The study appears to have been well designed and conducted and some preliminary results have been made available to an official of my Department. However, it will be some time before a full analysis is publicly available. If you should require further details, you may wish to contact Ethyl Canada, the Canadian subsidiary of Ethyl Corporation, Inc.

The second study, under the direction of Dr. Joseph Zayed of the University of Montreal, will look in detail at exposure to manganese from MMT, as measured by chemical, biological, and personal monitors. If increased exposure is demonstrated, this study will be followed up by an epidemiological study to determine if any subtle health effects can be discerned in an environmentally-exposed population.

With regard to absorption and metabolism of MMT, and in response to your comments concerning the comparison of MMT to lead, it is important to note that there are critical differences between these two elements. In the case of lead, a significant portion of the exposure came from the ingestion of lead-contaminated soil by toddlers, and was indirectly caused by airborne lead from automobiles. In general, the metabolism of metals is quite different for infants and children than for adults. Absorption through ingestion for children is high, and, in some cases, excretion is low or nil. For lead, absorption from soil or dust is considered to be 50 per cent for a two year old (versus 10 per cent for an adult). However, for manganese, the metabolic pattern for children over two years of age is similar to that of an adult; absorption via dust and dirt has been calculated to be 10 per cent or less. Exposure through ingestion, therefore, is much less important for manganese than for lead.

In addition, normal concentrations in soil are around 800 parts per million for manganese, and 5-25 parts per million for lead. Average airborne manganese concentrations are around 0.04 micrograms per cubic metre, or about 10 times lower than air lead concentrations were in 1979. Thus, air lead made a much more significant impact in raising naturally low soil levels of lead than is the case with manganese, where low air levels are not expected to contribute a significant amount to naturally occurring high levels of manganese in soil.

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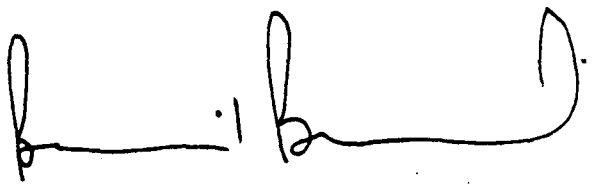
Finally, I would like to point out that officials of my Department were consistent for some years in asserting that airborne lead from the use of tetraethyl lead contributed significantly to total exposure to a known toxicant. My Department also asserted that it would, as a result, be prudent to reduce exposure by means of regulation of this fuel additive under the (former) Clean Air Act. The final regulation came into effect on December 1, 1990.

I do hope that the above explanation proves helpful to you. Thank you for writing and providing me with an opportunity to respond to your concerns regarding this important matter.

With every best wish.

Yours sincerely,



Benoît Bouchard

Minister of National Health and Welfare

CANADA

Ministre de la Santé nationale et du Bien-être social

Ottawa, K1A 0K9

22 V 1991

The Honourable Ralph Ferguson, P.C., M.P.
Lambton-Middlesex
House of Commons
Ottawa, Ontario
K1A 0A6

Dear Mr. Ferguson:

Thank you for your letter of April 29, 1991, regarding ethanol and statements made by Ms. Grace Wood, an official of the Health Protection Branch of my Department, about studies concerning MMT.

In response to the issues you raise in your letter, officials of my Department have reviewed the information related to ethanol fuels and believe that it can be used safely in motor fuels. As stated in my predecessor's response to your inquiry of December 7, 1990, there is no known health risk associated with the use of ethanol as a fuel additive "...at the concentrations that would be present in air..." if it were so used, particularly since it would be employed at less than ten per cent of the total gasoline mixture.

Ethanol produces acetaldehyde when burned, which is irritating to mucous membranes and is considered to be probable human carcinogen by the International Agency for Research on Cancer, an agency within the World Health Organization. However, concentrations of acetaldehyde produced by combustion are reported to be reduced to background levels, or close to them, by catalytic converters currently in use. Departmental toxicologists do not regard these concentrations to be harmful.

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With respect to your question about two studies referred to by Ms. Grace Wood in remarks to a newspaper reporter published on April 28, 1991, I would like to explain the following. One of the studies referred to was a monitoring study conducted in Toronto during February 1991. This study has not yet been published, although my officials have preliminary knowledge of the results. The other was a proposed epidemiological study to be conducted in Montreal. Officials of my Department were consulted only during the design phase of the study.

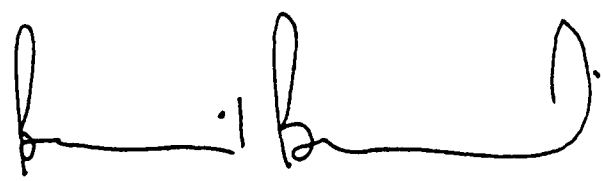
I can assure you that my officials had no knowledge of either study when my predecessor responded to your question No. 425 on December 7, 1990. In addition, I should emphasize that neither study has been conducted by, nor commissioned by my Department, and that officials of my Department only learned about the studies because they were consulted as a result of their reputation as scientific experts in the field.

Finally, you will be interested to learn that the Toronto study was designed to refine the estimates of exposure to people in heavy traffic conditions, and that the results appear to confirm my Department's earlier conclusion that the Canadian public is not at increased risk as a result of the use of MMT in gasoline.

Thank you for writing and providing me with an opportunity to respond to your concerns on this important matter.

With every best wish.

Yours sincerely,



Benoît Bouchard

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PROGRAM: EMISSION:	RADIO NOON	DATE: DATE:	NOVEMBER 23, 1990
NETWORK / STATION: RESEAU / STATION:	CBC/CBO	TIME: HEURE:	12:20

GAS ADDITIVES MAY BE HARMFUL TO HEALTH

CBC: Up until a few years ago lead was used in automotive gasoline as an octane improver. In other words, it kept our car engines from knocking. Unleaded gasoline has a compound called MMT in it instead of lead. John Donaldson, a scientist who studies neurotoxins thinks it might be dangerous to our health. Good afternoon, Dr. Donaldson.

DONALDSON: Good afternoon, Rob.

CBC: You have been studying neurotoxins for a long time. What is a neurotoxin exactly?

DONALDSON: Well, essentially this is an agent which has the ability to cause behavioral damage or neurotoxic damage, to cause insult to the nervous system. And the one which I've been working with for some time actually is manganese which is a metal.

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CBC: And it can cause that kind of damage to the human brain, can it?

DONALDSON: Yes, I think actually one of the things which attracted me to manganese and I've had a love affair with manganese for about 20 years was essentially its ability to induce neurological damage almost identical with Parkinson's Disease. And this is why I started to address how this metal line could possibly produce symptoms of Parkinson's Disease and also brain damage which was similar to Parkinson's Disease. We didn't know what caused Parkinson's Disease. We still don't know what causes Parkinson's Disease.

CBC: What kind of evidence is there that the compound MMT is related to Parkinson's Disease?

DONALDSON: Well, actually I guess this is really to be coherent with this this really begins in Washington actually in the early spring actually of this year, the Environmental Protection Authority hearings. And I was asked to go down there as a witness for the EPA because the manufacturer of MMT, Ethel(?) Corporation of Baton Rouge, was asking for a waiver to allow it into American unleaded gasolines. It had been banned since 1978, I believe.

So this waiver was to present evidence which was that MMT containing manganese as a fuel anti-knock device was, in fact, safe. Essentially the important thing was that this company was presenting the evidence for its use in American gasolines that had been used in Canada for ten years. And the Canadian Health and Welfare and Environment

B1

Canada had found no reasons to prevent it being used in Canadian gasolines. Now I and several others actually at the hearings objected quite strongly to this.

CBC: As a scientist, as a researcher should manganese be banned in this country as well?

DONALDSON: I think this is proved very well actually by one of the groups which presented some documentation. Now this was the United States House of Representatives, the sub-committee on health and the environment. And they said, for example, they understand that scientists have not yet fully determined what exposure levels of the adverse effects of manganese begin and America has not recovered from th painful experience caused by another neurotoxic additive, lead, in gasoline.

CBC: So we're not sure if there are safe levels of manganese?

DONALDSON: That's exactly right. You see, there's been an enormous advances made in neuroscience over the last ten years and what we're afraid of now actually is that certain neurotoxins like manganese and I believe manganese to be an age enhancing agent that can actually set our chronometer forward so the brain clock which ticks away actually and causes degeneration of the cells as we age is actually accelerated. On one of the major proposals put forward now by people in neuroscience is that the diseases like Amyotrophic Lateral Sclerosis,

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ALS, Parkinson's Disease and Alzheimer's Disease occur as a result of aging in a particular region of the brain and this may have occured because of a clinical insult or a sub-clinical insult early on in life so that consequently as the cells age in life in view of the environmental damage that's been caused earlier by some agent, manganese or aluminum or whatever other agent that's being examined or suspected that there's an enhancement of the normal aging process so that one ends up actually, let's say in the case of Parkinson's Disease, you normally have about 40 per cent destruction of cells in the substantia (inaudible), by about 50 years of age you would have 75 per cent destruction which would give you Parkinson's Disease.

CBC: Dr. Donaldson, if it isn't banned in this country should there at least be emission standards for it?

DONALDSON: I think that...I think quite frankly actually that the ...what we're addressing here actually is a risk predominantly to children. You see in relation to neurotoxin and specifically to manganese the real effects of manganese are in a developing brain. So that manganese is a specific toxin for the younger individual. There are two reasons for this. Number one is the young people until they're about six or seven years of age don't have a blood brain barrier. This is a filtering apparatus which the adult has which normally occludes heavy metals and other toxins which would damage the brain.

Secondly, they also don't have a developed excretory apparatus to excrete the manganese. So it's a double whammy, no blood

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brain barrier developed properly and no excretory apparatus developed. S consequently the effect of manganese in the young are very insidious and very progressive.

CBC: Is there other evidence from other parts of the world that manganese can have a detrimental effect on human behavior, human health?

DONALDSON: There are six cases just published actually in archives on neurology from China where they found that these individuals exposed to environmental manganese loads in industry came down with Parkinson's Disease. And also they did the levels of manganes in the hair of these individuals and the levels of manganese were directly correlated with the clinical symptoms. In other words, the mor manganese they had in their hair the greater the degree of incapacitatio they had clinically. So there is very good evidence...much of the evidence that has come from Chile where manganese miners the condition i known colloquially there as Laquera Manganika(?) in Spanish. It means manganese madness. It's been known for many years to occur in miners wh have been working in the manganese mines where they first of all underwent this peculiar acute symptomology of psychosis, manganese psychosis. And after about six months they developed Parkinson's Disease.

So much of our studies actually have come from the place like Chile and now more recently in China. It seems to parallel the industrialization. This is why most cases around have been reported fro China being the last to come into the industrial age as it were.

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CBC: Dr. Donaldson, thank you very much.

DONALDSON: Nice talking to you.

CBC: Dr. John Donaldson is a neurological biochemist studying the effects of MMT and in particular manganese on our health.

Grace Wood works in the environmental health directorate of Health and Welfare Canada. Mrs. Wood, is your department monitoring the compound MMT?

GRACE WOOD: Yes we are. We've been checking on MMT, keeping an eye on it so to speak since about 1978 because we've been allowing it to be added to gasoline in Canada as you know and the United States did not allow it after 1978.

CBC: What concerns has Health and Welfare have about manganese in particular in this compound?

WOOD: Well, I think they're the same concerns that Dr. Donaldson mentioned, that in high concentrations it can cause neuroligical damage. I think that you are well aware that Health and Welfare was very insistent that we wanted lead out for the same reason, because we felt that it really was damaging to the brains of young children.

B

CBC: Is Health and Welfare looking at alternatives to MMT in our gasoline?

WOOD: We have looked at some alternatives. We've looked at what might be expected from things like ethanol, methanol. We will be looking at a third one. It's called metholtertirarybutalether(?) which is an alcohol related compound and at another possible way of doing it is to increase aromatic content which might cause increase in benzene which is of concern to us.

CBC: There are concerns that the amounts and the levels of manganese that are being used in automobile gasoline right now are perhaps not safe. How does Health and Welfare know? How are you sure that what we're using right now is safe enough for us?

WOOD: Well, the toxic effects from manganese inhalation are pretty well documented. I think that Dr. Donaldson mentioned a few. But they're at levels, the lowest level in air is abou 1000 times greater than the highest concentrations that we have in industrial cities and about 10,000 times higher than we have in a city like Toronto which doesn't have particular industrial sources. We have four cities in Ontario with quite high levels, 10 times higher than the average.

CBC: What is Health and Welfare going to do next? What are the future plans regarding MMT?

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WOOD: I think that we'll continue to watch. I think that it's not up to Health and Welfare to choose which additive to use. We've said that we don't mind ethanol. We feel that it's disadvantages, the production of aldehydes as you're probably aware. But all of them have some disadvantage and they can be handled by the catalytic converters.

Now we will be watching manganese as well obviously and continue to watch the exposure to manganese and try to...and to take in all the new studies on what might be constitute a toxic level. (inaudible) level's so low compared to anything that has ever been shown even pre-clinically to have any effect that we've not been concerned. I mean, 10,000 times less than the toxic effect is quite low.

CBC: All right, Mrs. Wood, thank you very much. Grace Wood works for Health and Welfare Canada. Coming up in just a moment, we'll talk to an MP who wants managanese banned in Canada.

(MUSICAL INTERLUDE)

CBC: Well scientists aren't the only people interested in MMT. It's also caught the eye of federal politicians. Ralph Ferguson is the Liberal MP for Lambton-Middlesex and he's tabled a Private Members' Bill in the House of Commons.

Mr. Ferguson, what does your bill ask for specifically?

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RALPH FERGUSON: First of all the bill asks that all automotive fuels contain at least 3.2 per cent oxygen and then the second part of the bill asks for a ban on MMT.

CBC: Why do you want that banned?

FERGUSON: Because of the neurotoxic substance that's in MMT. MMT is an octane enhancer. In my mind it's not at all environmentally acceptable as if we have a minimum requirement of 3.2 pe cent oxygen, that means ethanol. Ethanol will lower the carbon dioxide emissions.

CBC: So you like the idea of ethanol as an alternative?

FERGUSON: Absolutely. It's a renewable fuel and in the growing of the grains or the trees that will provide the base product for the ethanol, it'll remove carbon dioxide from the air as well. So you have a double barreled impact here on ethanol and it means that you'll have cleaner burning fuels. So consequently there's a very positive plus side to move towards an ethanol gasoline blend.

CBC: We've heard that there are health concerns possibly that this compound may have on our health. Are you concerned about that aspect of it as well?

FERGUSON: Yes I certainly am concerned about it because this substance has been banned in the United States sinc

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1978 and yet we're continuing to use it in Canada and there's growing medical evidence to indicate that the manganese component of the MMT is an insidious neurtoxic substance that is taken in through the respiratory system and may damage the brain cells and children are particularly susceptible to this because their immune systems aren't yet in place.

CBC: Was it banned on that basis in the United States?

FERGUSON: It was banned in the United States due to the fact that it was causing great damage to the catalytic converters on the cars. Now I have letters here from General Motors of Canada and Mercedes asking our government to ban it here in Canada.

CBC: So car companies want it banned because of the damages to...

FERGUSON: The catalytic converter.

CBC: ...the catalytic converters. They're not concerned about the environment or...

FERGUSON: They haven't said anything about the health component of the risk at the present time. But one of the shocking things that I ran into is that Department of Transport Canada does not use gasoline containing MMT when they're conducting their emission tests on our automobiles because they simply will not pass the tests if this substance is used. So they use gasoline that doesn't contain MMT in

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order to pass the emission standards. Now I think this is a circumvention of the objectives of auto-emission testing and I think the Canadian people should be aware of it and demand that we're using products that are safe for our children, safe for the people of Canada and are environmentally friendly.

CBC: With the kind of automobiles that we drive these days though, can we have gasoline that doesn't have manganese in it?

FERGUSON: Absolutely. I used an ethanol gasoline blend in my vehicle back in the early '80s. In fact the United States...the farmers in the United States, if they want to collect their farm fuel rebate in the State of Michigan, have to use an ethanol gasoline blend. Otherwise they don't get their farm fuel tax rebate bac to them. So it is environmentally friendly and the automobile dealers and companies certainly recommend it. There's no problem as far as the combustion engine is concerned.

CBC: Mr. Ferguson, how much support do you have for your bill?

FERGUSON: I'm just delighted with the support I'm getting. I launched a petition through a radio station in London, Ontario and we've had over 2,000 names come in with that one. I'm havir petitions pour into my office. There's one last night, a radio station in Newfoundland called me and they're starting a campaign down there and

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they even had a man in the studio who feels that he's a victim of the manganese poisoning and I'm just delighted with the support I'm getting. I hope that we can perhaps get the government to move on this before my Private Member's Bill even comes up for debate.

CBC: What stage is it at right now?

FERGUSON: My bill is in the lot and the next drawing, it'll be something like the luck of the 649. Everybpdy has to take their chance at having their own bills drawn out. I hope that we'll have something, but one never knows. In the meantime I'm not going to sit still. I'm going to do everything in my power to have the government move in a ban this product from our gasolines and automdtive fuels.

CBC: Mr. Ferguson, thank you.

FERGUSON: Thank yor for the opportunity to be here with you.

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	Radio Noon	DATE:	November 12, 1990
ATION:	CBL - Toronto	TIME:	12:00 p.m. EST

CHRISTOPHER THOMAS (Host): It's possible that ingredients in Canadian gasoline are a health risk. MMT is a product that adds octane to our gasoline. Its primary ingredient is manganese and exposure to manganese has been shown to cause Parkinson's disease. Now, MMT was banned in the United States in 1978, but we still use it here. To date, the Canadian government hasn't sanctioned any research into the effects of MMT. Joining me now are Dr. John Donaldson. He's president of Biotox Research Services. It's an environmental consulting firm. And also the Hon. Ralph Ferguson, the Tory Member of Parliament for Lambton-Middlesex. He recently tabled a Bill asking for the ban of MMT. They both join me by telephone. Good afternoon, gentlemen.

MR. FERGUSON: Hi.

DR. DONALDSON: Good afternoon.

THOMAS: Dr. Donaldson, let me start with you. Can you tell me what MMT is and what its effects are?

DR. DONALDSON: Well, MMT actually is the abbreviation for an enormous name, actually. A real tongue twister called "methylene sanclaphenatodo tricarbonal manganese" (ph).

THOMAS: Hm-hmm, easy for you to say.

DR. DONALDSON: This is used actually as an anti-knock, an octane enhancer in gasolines, in all unleaded gasolines. And so, virtually it's contained in all Canadian gasolines.

THOMAS: And it was introduced largely to help control pollution, right?

DR. DONALDSON: Well, it was introduced as a anti-knock device, actually, to increase the octane ratings of Canadian gasolines.

THOMAS: Right.

DR. DONALDSON: I understand it was banned in 1978 by the

Environmental Protection Authority in the United States because it increased the hydrocarbon content in U.S. gasolines. So it has been on hold for the last ten, eleven years or so in the United States.

THOMAS: Right. Now, what are the negative impacts?

DR. DONALDSON: The negative impacts, to my point of view, actually are that it contains manganese. And I've had an interest in manganese for some considerable time, actually. It started about oh, fifteen years ago when I was at the Clinical Research Institute in Montreal with Andy Barbeau and we were trying to discover the cause of Parkinson's disease.

THOMAS: Is there a link with manganese?

DR. DONALDSON: Well, actually, yes. As you know, we don't know what causes Parkinson's disease, but there is a loss of dopamine in a region called the "substanti niger" (ph). And the low dopamine actually leads to the symptoms of Parkinson's disease. And so, the enigma was to try and find out the rational underline why these cells were being destroyed. And I was quite interested to find in the literature that in Chile, in the manganese mines, that Chilean miners came down with symptoms very closely resembling those of Parkinson's disease.

THOMAS: Now, is it just Parkinson's or are there other health effects too, other symptoms?

DR. DONALDSON: There are, actually. It's quite intriguing, actually, in literature in relation to the studies done in Chile. There is an acute phase, which is sort of psychiatric and the local people called it "lucramanganica" (ph), which is called "manganese madness". This was a psychiatric phase -- a sort of psychotic phase when they would -- strange laughter and crying. They would chase after cars. A very compulsive sort of thing. And it's been linked by some psychiatrists to -- as being similar to amphetamine psychosis.

THOMAS: Now, I know some researchers or that you've come across studies that show hair samplers from murderers in California

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have high levels of manganese.

DR. DONALDSON: Yeah, well, those are not my studies actually. But I understand from -- there's a group in California at the University of California which has linked the levels of manganese in hair to violence and aggression actually and they're using this. And the National Institute of Justice in Washington, I believe, is presently pursuing a research project which will attempt to see if manganese could be a physiological marker for determining violence.

THOMAS: As I mentioned, the Tory MP for Lambton--Middlesex, Ralph Ferguson, has been trying to get a Private Members' Bill through to ban this substance. Mr. Ferguson, what led you to want to take this course of action?

FERGUSON: Well, first of all, maybe I should say that I'm a Liberal MP from Lambton--Middlesex.

THOMAS: I'm sorry.

FERGUSON: And one of things that concerned me ---

THOMAS: I put you in government before your time.

FERGUSON: Yes, sir. One of the things that I looked at was the fact that we are into an energy shortage in Canada. Our conventional oil supplies are diminishing. And I was also deeply concerned about the manganese in the fields we're using now and the fact that the Department of Transport doesn't use manganese in the fuels when they test their cars for the emission standards. So I was looking for a Bill to legislate the fact that we'd have to ban MMT, such as they've done in the United States. But I was also looking for a way to make sure we had a 3.2 per cent oxygen content in gasoline. And this would leave the option as to how the industry meets this requirement of their preference. But they're only a few additives, which would fill such a requirement, presently other than ethanol. MTBE is one of them and ETB is ethanol-based at well. But ethanol is environmentally positive. It's a renewable resource. The production of which would create an additional market for

Canadian grains and provide a model for sustainable development. And currently with the embargo on our grains to Iraq and the situation of the world marketplace, I felt that ethanol was the route to go.

THOMAS: Yeah. So you started looking into MMT, right?

FERGUSON: Yes. I looked at both at the same time.

THOMAS: Hm-hmm. When you started asking questions about the MMT, what response did you get?

FERGUSON: I received a response that -- first of all, that the Department of Transport couldn't use it and have the cars meet their emission standards. And in fact, really, when I asked the Minister of the Environment in the House of Commons a week ago last Wednesday about this, he really didn't know what I was talking about.

THOMAS: So they obviously didn't know there was a problem?

FERGUSON: They weren't aware of it, although people in the Department of Transport were aware of it because I was in touch with them. So consequently, I want to see if we can make this change. The Canadian Renewable Fuels Association, in their brief to the Standing Committee of the Environment considering the issue of global warming, predicts that a 10 per cent ethanol-based gasoline would also mean at least a 10 per cent reduction in carbon dioxide added to the atmosphere comparing to the regular gasoline over the same number of kilometres driven.

THOMAS: Right. If I can get away from ethanol for a second. We've talked a lot about that on the show. I want to focus in on the MMT. When you tried to get this banned -- I mean, do you have any hope that you just for the sheer physical health effects on humans, the potential, do you have any hope you can get it banned from our gasoline?

FERGUSON: Yes, I do. I think it's just simply a matter of time. As the people of Canada become aware of the health risks involved here, if we look at the facts -- perhaps Toronto itself is becoming one of the most polluted cities in North America --

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then I think the people themselves will demand that government remove this from the gasolines and make for a safer environment, reduce the level of thinning of the ozone and the climate warming.

THOMAS: Dr. Donaldson, should we be worried about this MMT that is in our gasoline now?

DR. DONALDSON: That's an excellent question actually. And being a neuro toxicologist -- I'd like to define that, if I may, actually.

THOMAS: Sure.

DR. DONALDSON: Because this is the sort of question, actually, that those that are responsible for drawing out regulations love. Is this toxic?

THOMAS: Right.

DR. DONALDSON: Well, you know, there's so many ways you can squeeze around this question. I'd like to be quite specific. Manganese has a preferential vulnerability to children and for the -- the main reason is that children don't have a well-developed blood brain barrier, which would normally occlude manganese. This is not developed up till about seven or eight years of age. And in addition, they don't have an exretory mechanism to remove manganese. And this doesn't develop till they're seven or eight years of age also. So there's a double-whammy here and the children represent a special risk group who are preferably vulnerable to the effects of manganese. And I'm talking about the neuro toxic effects of manganese. And it's important that -- this should be addressed, actually.

THOMAS: So the impact on children especially, as you put it, driving in cars is what, just the fumes that come out of the car as part of the emission or how does it work?

DR. DONALDSON: Well, actually, what all we're talking about specifically is what is burned -- like what emerges, actually, is manganese and it's a particular type of manganese called "higher vilmes e manganese" (ph), in which the manganese is in

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the form called "trivalent", MM3. Normally, manganese is present as MM2 and this doesn't do any harm whatsoever, actually. But MM3 form, which emerges from the tailpipe actually, is the most insiduous form because it's rather like a computer virus. You see, the symptoms of Parkinson's disease, as I mentioned, don't develop till the loss of about 80 per cent of those cells in a particular region that makes dopamine a substanti niger. Now, those cells are continually declining through age. Manganese, actually, is an age-accelerating projectile. So if you insert this, like a computer virus, at five years of age or ten when we have 5 per cent destruction acceleration at ten years of age and twenty years of age, another 15 per cent from contamination by manganese or other putative neuro toxins. So ultimately when we get to, let's say, about 50 years of age or 55, when we've usually lost about half of those neurons in any case, the risks we've had and the sub-clinical effects of those in early years becomes additive. So instead of 50 per cent, we're ending up with 75 to 80 per cent destruction and the clinical symptoms of Parkinson's disease then emerge.

THOMAS: Ralph Ferguson, in your attempts to get a Private Members' Bill to ban this, did you come across any explanation as to why -- clearly this was understood at least back in '78 in the U.S. and nobody even seems to know about this now until Dr. Donaldson started exposing it.

FERGUSON: That's right. The people in government, the day I asked the question in the House of Commons, really didn't know what I was talking about. And I'm not sure why they weren't on top of this because they'd receive letters from General Motors to the Department of Transport back in 1989. Also, a letter from Mercedes Benz ---

THOMAS: Mercedes Benz?

FERGUSON: --- about these concerns. And yet, nothing was done.

THOMAS: Sorry, did you say Mercedes Benz was concerned, too?

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FERGUSON: Yes. As well as General Motors of Canada.

THOMAS: So the auto manufacturers are aware of this?

FERGUSON: That's right. Yes, they are.

THOMAS: And nothing was done?

FERGUSON: No, that's right.

THOMAS: Dr. Donaldson, Ralph Ferguson has mentioned ethanol as an alternative. Is that the route to go here? It's an alternative to MMT?

DR. DONALDSON: I'm not an engineer, actually, but -- and I'm not aware of -- I understand ethanol actually, of course, is a renewable resource. It sounds like an excellent way. And I believe I mentioned this. I actually -- I discussed this in my report to the National Research Council a couple of years ago on manganese in the Canadian environment. And I believe I did mention it at that time, actually.

THOMAS: Wow. And nobody picked it up, eh?

DR. DONALDSON: As a matter of fact, to go further than that. This was probably just over -- well over a year ago, actually. And at the EPA meetings in Washington in the spring when I -- I was called as a witness there. And the EPA members on the panel actually had copies of this document. And after I had given my testimony concerning manganese, I was approached by one individual, who had asked if they could have a copy of it, and this individual was with the Health Protection Branch in Canada. So in other words, the United States had copies of this report and were well aware of the problems, but the Canadian -- responsible individuals, actually, had to go to Washington to find out about this.

THOMAS: God, that's depressing, isn't it?

DR. DONALDSON: Yeah. It is, actually, yeah.

THOMAS: Yeah. What do you sense -- I mean -- I don't know. Do you sense any more optimistic view of the future now that it seems to get more attention?

DR. DONALDSON: Well, what it really means actually -- you see,

manganese is the tip of the iceberg, actually. I think that the Health Protection Branch has to become aware that this risk is out there and they have to set up the expertise to be able to deal with it and to recognize it. Burying it doesn't mean it's going to go away. It's something we have to deal with.

THOMAS: We'll stay in touch on this to find out what happens. I thank you both for talking to us, though. Good luck with the Private Members' Bill.

FERGUSON: Thank you. It's a pleasure being with you.

THOMAS: Thank you both.

DR. DONALDSON: Bye, bye.

FERGUSON: Bye, bye.

THOMAS: I've been talking with Dr. John Donaldson. He's President of Biotox Research Services. He has come across some startling revelations about the manganese in our gasoline and the link to Parkinson's disease. Also, Ralph Ferguson, the Member of Parliament for Lambton--Middlesex, who is sponsoring a Private Members' Bill to get MMT banned from our gasoline.

--- END

Tiger in your tank may rot your brain

Experts say manganese, a heavy metal used in unleaded gasoline, can be absorbed into the body and damage our brains and sex hormones.

NICHOLAS REGUSH
THE GAZETTE

Another tiger in Canadian gas tanks may be helping to destroy our brain cells, disrupt our sex hormones and make us violent, experts in toxic metals claim.

Gasoline has been free of lead since December but scientists and environmentalists now are taking a harder look at manganese, a heavy metal used in the octane booster MMT that prevents engine knock.

And one politician from London, Ont., is urging the federal government to follow a U.S. ban on the compound — methylcyclopentadienyl manganese tricarbonyl — in unleaded gasoline.

"It's a case of sheer neglect for Health and Welfare Canada and Environment Canada to allow the use of MMT to continue," said Ralph Ferguson, Liberal MP for Lambton-Middlesex.

Manganese can be inhaled through exhaust emission particles or absorbed through the skin when touching gasoline.

Some manganese miners suffer temporarily from

PLEASE SEE MANGANESE, PAGE A2

MANGANESE *Moderate doses in rats affect sex hormone levels*

CONTINUED FROM PAGE A1

hallucinations and then go on to develop symptoms such as rigidity of movement and tremors similar to Parkinson's disease.

Studies by John Donaldson, a neurological biochemist who heads a consulting firm called Bio-Tox Resources in Perth, Ont., show moderate doses of manganese in rats can disrupt sex hormone levels, including testosterone, and cause impotence.

Donaldson, a co-author of a major report in 1988 on manganese for the National Research Council, is also concerned that the metal may trigger an acceleration of the brain's aging process and that the "hit" can occur even in the womb.

And three recent California studies have linked high manganese levels in hair samples to violent behavior.

Ferguson introduced a private member's bill last month arguing that MMT could be replaced with "more environmentally friendly" ethanol.

Ethanol would have fewer health risks and in raising the oxygen content of gasoline it would reduce carbon dioxide and monoxide emissions, he said.

And because ethanol is made from grains such as corn, barley and wheat, its use in gasoline could give Canadian farmers an economic boost.

Once widely produced, ethanol would not add to the price of gasoline, he said.

Even General Motors of Canada wants MMT banned.

The Oshawa, Ont., car manufacturer wrote Transport Canada in 1989 that MMT adds unnecessarily to toxic emissions.

The U.S. first banned MMT in unleaded gas in 1978 because it increased its hydrocarbon content. A strong push last year by Ethyl Corp. of Baton Rouge, La., to reintroduce MMT in unleaded gasoline failed because of concerns about public safety.

Children until about the age of 7 cannot effectively flush manganese from their bodies, he said.

But David Wilson, president of Ethyl Canada in Mississauga, Ont., which manufactures MMT, told *The Gazette*:

"The amounts of manganese absorbed from the air are very insignificant, in our minds."

The company also claims MMT helps clean up pollution by decreasing the amount of a gas that is involved in the production of low-level ozone.

Health and Welfare Canada also says there is little health risk associated with MMT.

"But there's more information coming," said department official Marcel Chartrand, referring to two studies that are looking at public exposure to MMT.

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Manganese in fuel may put iron-deficient infants at risk

Experts cite possible brain-cell damage

NICHOLAS REGUSH
THE GAZETTE

Iron deficiency could make infants more vulnerable to brain-cell destruction by manganese, a heavy metal found in food, water and gasoline emissions, experts in toxic metals warn.

The iron-manganese connection explored in recent studies is adding fuel to the controversy in Canada swirling around the use of manganese in unleaded gasoline.

Through the skin

Though manganese is essential for human life, concern is mounting that many Canadians may be overexposed to it over time.

Manganese can be inhaled through exhaust emission particles or absorbed through the skin when touching gasoline.

Some Canadian politicians and scientists are urging the federal government to follow a U.S. ban on MMT — methylcyclopentadienyl manganese tricarbonyl — in unleaded gasoline. They cite studies showing that manganese has the potential to disrupt sex hormones, make people violent, and cause rigidity of movement and tremors similar to Parkinson's disease.

"We have to call on the government of Canada to step in immediately and protect the health of this nation's children," said Ralph Ferguson, Liberal MP for Lambton-Middlesex. "We can't afford to continue to use neurotoxic substances in our fuel when alternatives are available."

Ferguson introduced a private member's bill in June that would require replacing MMT with Ethanol, which would have fewer health risks and reduce carbon-dioxide and carbon-monoxide emissions.

Ethyl Corporation of Mississauga, Ont., which manufactures MMT, contends the amounts of manganese absorbed from the air are insignificant.

Health and Welfare Canada also says there is little health risk associated with MMT.

But recent studies of rats at Albany Medical College in Albany, N.Y., indicate that iron deficiency can lead to higher concentrations of manganese in the brain.

The two metals, which accumulate in similar areas of the brain, essentially compete with each other for space, said Michael Ashner, a neurotoxicologist who headed the studies.

"We don't know the safe range of manganese and what it means to be chronically exposed to it, but we may be jumping the gun by rushing into using manganese in gasoline."

Ashner said he hopes society will not make the same mistake with manganese as it made with lead by assuming low doses of the metal had little effect on the body.

"Only recently we've learned that low doses of lead can affect IQ in children," he said.

Gasoline has been free of lead in Canada since December.

Ashner also said much more research will have to be done to understand better the interplay of iron and manganese and possibly other metals in brain disorders.

Data are not available on how many Canadian children are iron-deficient.

Major report

Several small studies published in recent years show that up to about 25 per cent of low-income infants suffer from iron-deficiency anemia.

John Donaldson, a neurological biochemist who heads a consulting firm called Bio-Tox Resources in Perth, Ont., and is co-author of a major report in 1988 on manganese for the National Research Council, is concerned that a manganese "hit" can even occur in the womb and trigger an acceleration of the brain's aging process.

MICHAEL PEAKE

The environment

Gasoline additive shocker

We all do our best to avoid harming ourselves.

We don't drink pesticides — except in very small amounts we don't know are there. Some of us who study the ozone layer don't suntan any more.

But none of us can avoid breathing.

And breathing in this city means sucking in car exhaust. Automobile emissions account for a major portion of Toronto's pollution. And what's in those car emissions are unnecessarily deadly.

Recently, the federal government phased out leaded gas because the heavy metal is what's called a neurotoxin. It gets into our brains and retards development.

So what did they replace it with? Yet another and maybe deadlier neurotoxin called MMT. This stuff has a long chemical name, but its critical ingredient is manganese. This metallic element is contained in MMT, which is used as an anti-knock ingredient to improve performance.

Manganese is both an essential nutrient and toxic element. This heavy metal is bad news for humans, according to many researchers. It produces symptoms similar to Parkinson's disease, among others. It can be inhaled through emission particles or absorbed through the skin when you touch gasoline.

'Cure' may be worse than the disease

Manganese is particularly damaging to children under nine who lack a fully developed blood brain barrier. It is an element, which means it can't break down. It stays in the soils and in us.

MMT has been banned in the U.S. since 1978. The company that makes it is the same one that produces the prohibited gas additive tetraethyl lead (TEL).

Ethyl was recently pushing to get MMT back into American gas. It was originally banned there because it screwed up the catalytic converters. Now we know it does more than that. The U.S. House of Representatives subcommittee on health and the environment doesn't like MMT and said so in a 1990 letter to the head of the U.S. Environmental Protection Agency.

"We are extremely concerned about the potential for serious health impacts from the introduction of MMT into gasoline," the letter to William Reilly reads.

Ralph Ferguson, Liberal MP for Lambton-Middlesex, wants to replace MMT with ethanol, a substance that reduces carbon dioxide emissions and has far fewer adverse health effects.

"It's a case of sheer negligence on behalf of the government to continue to allow this to be used in Canada especially when there are environmentally friendly alternatives available," said Ferguson, who has a private member's bill promoting the use of ethanol and banning MMT.

Ferguson claims that ethanol, made from grain or wood byproducts, will reduce the amount of carbon dioxide and carbon monoxide we put into our air every year. It does the same job MMT does but with fewer problems for the planet.

Ethanol-blended gas has been chosen by the Environment Canada as one of their Environment Choice products - meaning it's better for the environment.

Health and Welfare Canada is responsible for banning the additive. They are currently doing three studies on MMT but admit they have been looking at it for a while. Try 13 years. That's a long time to just look.

How can we continue to poison ourselves and our children when better and more environmentally logical choices are available?

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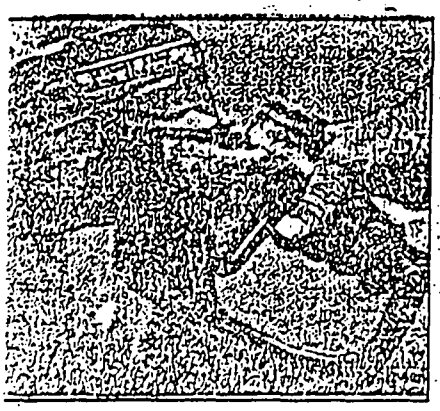

MMT has replaced lead

There's a new toxin—MMT in your tank

BY SHAWN APEL
Citizen correspondent

Soon after lead was banned from most Canadian gasoline, questions are being asked about the health effects of MMT, another octane booster. And some scientists are saying the government should have looked for the answers long ago.

They worry MMT, a widely-used manganese-based compound, might cause neurological damage. The additive has been in Canadian gasoline since 1977, but its use grew as lead's declined.

Probably the most outspoken critic of the government's handling of MMT is Dr. John Donaldson, a Perth, Ont. neurotoxicologist, who says the authorities have decided to turn a blind eye.

"Nothing's been done here. It's just been assumed there are no problems," Donaldson says. "The government doesn't want this to happen. They figure there are enough toxins around. Why worry about neuro-toxins?"

The manganese in MMT is dangerous, Donaldson says, because it is inhaled in particle form. He believes the additive might cause rapid aging of the brain and Parkinson's-like symptoms by destroying the chemical dopamine in the brain. Children are especially vulnerable because they can't block manganese, he says.

Scientists have long known manganese to be neuro-toxic at extremely high levels, but Donaldson and others now point to recent workplace studies from Belgium and Sweden which show even low doses of MMT might be causing serious harm. It could also be linked to infertility and psychological damage, Donaldson says.

Donaldson has done much of his research into manganese outside Canada by studying manganese miners in Chile and aborigines in Australia, for example. Proper Canadian government research is long overdue, he says.

Grace Wood, a Health and Welfare official responsible for approving MMT, says the government is now cooperating with two private studies, one in Ontario and another in Quebec, and is now waiting for results. She says there's no reason for a ban in the meantime.

"Yes, it's a neuro-toxic, but a lot of things are," Wood says. "It depends on the dose people get. I don't think a dose that small is going to do any damage."

Limited awareness

Frank Labella, a University of Manitoba pharmacologist, says it might take 20 years to prove exactly what MMT is doing, just like it took time to prove the harmful effects of lead.

There is limited public awareness of MMT. About 9,000 southwestern Ontario residents signed a petition last fall to replace MMT with ethanol, a wheat-based additive, and Ralph Ferguson, MP for Lambton-Middlesex, tabled a private members' bill asking for the same thing. But ethanol is far more expensive than MMT and might cause worse pollution, says Health and Welfare's Wood.

Meanwhile, Canadian MMT is making waves in the United States. The Ethyl Corporation, the additive's sole manufacturer, is seeking permission to put MMT in American unleaded gas.

Officials at Ethyl Corporation, which also produced most of the lead-octane booster, point to what they call a spotless Canadian record. They say MMT barely adds to manganese in the atmosphere.

"It's the only readily defined part of the world where MMT is used," says Gary Ter Haar, a vice-president of health and environment for the company. "And there are no adverse effects, and no elevated concentrations in the atmosphere."

Ethyl's U.S. application calls for MMT levels less than half those in use in Canada.

Scientists question using the Canadian experience as an example of how to handle MMT.

"Canada has been a human laboratory," says Sylvain Loranger, a Université du Montreal bio-statistician involved with the Quebec exposure study. It will study MMT near ground level, unlike previous high-altitude studies.

"We don't have to be alarmists," Loranger says. "We should be concerned. We must study it and not wait 30 years like we did with lead."

behavior modification

Illness imprisons sufferer most days

PARADISE, Nfld. (CP) — David Halleran spends most of his days indoors — imprisoned by an illness from exposure to a compound added to unleaded gas.

It's a life without work or the convenience of driving a car. It means supporting his wife and two young children on a federal disability pension of $626 a month.

"It's a living hell I wouldn't wish on anyone. This is my world," says Halleran, waving his arms at the walls of a tiny clapboard house owned by his in-laws in this town just outside St. John's.

Halleran, 51, has been fighting the effects of the additive, known as MMT, since 1976, when he had to leave his job as a mechanic at Newfoundland Steamships after the company switched to unleaded gas.

That's when his face, tongue, lips and feet started to swell and his skin burned. Over the years, he's had trouble with tunnel vision, headaches, tiredness and memory loss. Now he's having heart trouble, a problem that coincided with the phase-out of leaded gas last June.

Halleran has been diagnosed as allergic to MMT, but he says others without such severe reactions are also being harmed by the compound containing manganese. He believes he's the first Canadian victim of the additive.

The additive has been banned in the United States since 1978. In Canada, MMT has been used by refineries as an octane booster in all premium brands of unleaded gas since the federal government announced it would ban leaded gas as of last December.

CITES 'BLUNDER'

"This is another in a series of sequential blunders," said Frank Labella, a University of Manitoba pharmacology professor. "We're just taking lead out of gasoline now after decades of proof that it's harmful. Now we're replacing lead with manganese and its toxic potency is a lot higher than lead."

Labella, who conducted a study on manganese after he learned oil companies were planning to use it, said it can cause symptoms similar to those of Parkinson's disease. They include tremors, loss of memory, staggering gait, hallucinations, psychotic behavior and muscle rigidity.

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Karel Kraan says he'd rather be dead than living as a prisoner in his own house, where he escapes health problems that he links to a compound added to unleaded gas.

''I wish somebody would shoot me,'' says Kraan, a former car-parts worker and manager of a gas bar.

''I'm literally confined to my home because I'm a danger to myself and society.''

Kraan, 38, of Alvinston, Ont., says he's been fighting the effects of an octane booster known as MMT since unleaded gas was first used in Canada in the mid-1970s.

After symptoms like dizziness, headaches, panic attacks, confusion, fatigue and a low sex drive got worse, Kraan left work about two years ago and relies on his wife's salary.

He says most doctors and politicians don't agree there's a problem with unleaded gas, so he's been unable to get proper treatment or any compensation for his illness so far.

''This is going to make AIDS look like the sniffles,'' says Kraan. ''And the politicians don't give a damn. I'm getting the supreme runaround.''

Kraan is not alone in pinpointing MMT as a health hazard.

Earlier this year, David Halleran, 51, of Paradise, Nfld., said he spent most of his days indoors without work or the convenience of driving a car because of the additive.

(^UNDER U.S. BAN@

After reading a story about Halleran's plight, Kraan phoned to get more information since doctors he'd visited in Ontario didn't know anything about the effects of MMT.

''It's pretty pathetic that I have to call a guy in Newfoundland to find out what medication he's on,'' says Kraan.

The additive, a compound containing manganese, has been banned in the United States since 1978.

But in Canada, MMT has been used by refineries as an octane booster in premium brands of unleaded gas since the federal government announced it would ban leaded gas for good as of last December.

Frank Labella, a University of Manitoba pharmacology professor who has studied manganese, says Ottawa traded one problem for another, more serious threat.

His research concluded that manganese has a toxic potency that is much greater than lead and can cause symptoms similar to those of Parkinson's disease _ including tremors, memory loss, staggering gait, hallucinations. It has also been linked with violent behavior.

But Grace Wood, acting head of the criteria section in the Health and Welfare Department's health protection branch, says there's no solid proof MMT in gas emissions causes acute health problems and that people can form allergies to it.

Wood says she was aware of the cases of Halleran and Kraan but hasn't heard about any others.

(^FOUND IN SOIL@

''We don't know whether it's MMT or something else,'' she said from Ottawa.

''You don't take peanut butter off the market because a couple of people have problems with it.''

The issue is complicated by the fact that manganese is abundant in the /ironment from other sources, including the soil and steel production.

''People are worried about MMT but not because they get an immediate health reaction to it,'' says Wood, adding that more studies may help solve the mystery.

Separating unleaded gas additives from other toxins is also a problem.

Peter Drebit, a former trades teacher in Saskatoon, says he thinks MMT could be one cause of his dizzy spells, blurred vision and nausea.

But Drebit, 57, has worked around other harmful substances for about 40 years.

He was recently awarded a wage-loss benefit from the Saskatchewan Government Employees Union that gives him about two-thirds of his salary.

''The doctors are so afraid,'' he says. ''Only two out of 15 or 16 specialists would say it was toxic poisoning.''

Kraan, who is still fighting to have his illness recognized, says he couldn't isolate his problem until he bought a lawn mower in 1985 which took unleaded gas.

''The oil companies know unleaded gas is poisonous,'' he says. ''But consumers are left on their own to suffer the consequences.''

FRIDAY, *March 29, 1991* **The London**

COURTS

Alvinston man facing charge of threatening Brian Mulroney

But a Liberal MP says the man, who says his health is being destroyed by a gasoline additive, is 'really crying out for help.'

By Beth Gorham
The Canadian Press

SARNIA-CLEARWATER — A man who says a gasoline additive is ruining his life has been charged with threatening to kill Prime Minister Brian Mulroney.

Karel Kraan appeared in provincial court here Thursday and was released on bail pending another court appearance April 30. In the meantime, he was ordered to seek medical help.

Kraan, 38, was charged with unlawfully uttering a threat to cause death.

He says he's fed up with living as a prisoner in his Alvinston house, where he escapes health problems he links to a compound added to unleaded gas known as MMT.

"He's really crying out for help," MP Ralph Ferguson (L — Lambton-Middlesex) said Thursday. "I do believe him. And I think the federal government has been extremely negligent on this issue. Hopefully some of the medical tests will identify the problem."

Ferguson said Kraan called his Ottawa office on Wednesday and then called government offices.

RATHER BE DEAD: Kraan, a former car parts worker and manager of a gas bar, said this week he'd rather be dead than suffering from effects of the additive, used as an octane booster.

He quit work about two years ago because of worsening symptoms, which include dizziness, headaches, panic attacks, confusion, fatigue and a low sex drive. He relies on his wife's salary.

He said most doctors and politicians don't agree there's a problem with unleaded gas, so he's been unable to get proper treatment or any compensation for his illness so far.

"This is going to make AIDS look like the sniffles. And the politicians don't give a damn."

Thousands of Southwestern Ontario residents signed petitions last year asking that the compound containing manganese be banned and replaced with ethanol, made from grain.

Ferguson, who has been involved in the campaign, said the federal Conservatives used old, incomplete research data to respond to public concerns.

Other Canadians have pinpointed MMT as a direct health hazard.

Earlier this year, David Halleran, 51, of Paradise, Nfld., said he spent most of his days indoors without work or the convenience of driving a car because of the additive.

The additive has been banned in the U.S. since 1978.

But in Canada, MMT has been used by refineries as an octane booster in all premium brands of unleaded gas since Ottawa announced it would ban leaded gas for good as of last December.

POTENT THREAT: Frank Labella, a University of Manitoba pharmacology professor who has studied manganese, has said Ottawa traded lead for another, more potent, threat.

His research concluded manganese can cause symptoms similar to Parkinson's disease, including tremors, memory loss, staggering gait and hallucinations. It has also been linked with violent behavior.

But Grace Wood, acting head of the criteria section in the health and welfare department's health protection branch, said there's no solid proof MMT in gas emissions causes acute health problems and that people can form allergies to it.

"We don't know whether it's MMT or something else."

Back Page, Business Section

FUELS

A push for cleaner gasoline

Lambton-Middlesex MP Ralph Ferguson says the current additive being used in gasoline should be replaced with ethanol.

By Tony Hodgkinson
Ottawa Bureau

OTTAWA — Ralph Ferguson wants Ottawa to help "grow" cleaner gasoline.

Ferguson, Liberal MP for Lambton-Middlesex, said Thursday the federal government should ban the additive methycyclopentadienyl manganese tricarbonyl (MMT) which replaced lead in gasoline.

MMT, a pollutant and carcinogen, should be substituted with ethanol, a chemical that would result in lower carbon exhaust emissions, he said.

Ethanol is a byproduct of grains, particularly corn, wheat and barley, and because it is rich in oxygen, it is an octane-enhancer in fuel.

Ethanol is extracted from grains by distillation. The leftover stillage, or mash, can be used as protein for farm animals.

LETTERS OF SUPPORT: Ferguson, who has letters from General Motors of Canada Ltd. and Mercedes-Benz supporting a switch from MMT to ethanol, has tabled a private member's bill in the Commons.

Called the "Automotive Pollution Reduction Act," the proposal advocates ethanol over MMT, and would match U.S. legislation that makes it illegal to sell gasoline with an oxygen content of less than 3.2 per cent.

FERGUSON

However, private member's bills seldom survive. Luck is an important factor. Periodically, such bills are put in a draw, like a lottery. The ones selected stand a chance of making it to second reading and on to a Commons committee for further review and possible adoption as legislation.

Ferguson will be currying support for his bill before the Liberal caucus's sustainable development committee next week.

He said he is optimistic that ultimately ethanol-blended gasoline will be available in Canada. In Michigan, farmers wanting a farm tax rebate must show that they used ethanol fuel.

The MP cited these benefits of ethanol use as a fuel additive:

- A 10-per-cent ethanol-blended gasoline would translate into a 10-per-cent reduction in carbon dioxide emissions and dramatically reduced levels of carbon monoxide.
- Being clean burning, it is less damaging to the environment.
- Ethanol is a renewable resource.
- As a fuel additive, it would create another market for growers of grains.

GLUT OF GRAIN: There is currently a glut of grain, made worse by the current embargo on Iraq. Further, international trade battles in the agriculture sector have depressed prices.

- In order to meet a 10-per-cent ethanol content in gasoline, about eight million tonnes would be required, just under one-fifth of current grain production of $50 million tonnes.
- The eight million tonnes would mean extra millions of dollars for Canadian farmers.

"There are tremendous benefits from this program, and we are lagging behind the U.S.," Ferguson said.

"Ethanol is an environmentally positive, renewable resource whose production could create an additional market for Canadian grains and provide a model for sustainable development."

Jim Johnson, a Lambton County farmer and president of the Canadian Renewable Fuels Association, said he supports the ethanol concept. For about five years, his group has lobbied the government to encourage ethanol-gasoline blended fuel. He said Ottawa should exempt ethanol from excise tax when it is blended with gasoline.

P17

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B

GASOLINE ADDITIVE

Mineral may be tied to violent behavior

It may also be linked to impotence, a scientist warns.

Staff/news services

TORONTO — A compound added to gasoline in Canada to control pollution may be linked to violent behavior, impotence and symptoms similar to Parkinson's disease, a scientist warns.

John Donaldson, a neurological biochemist and assistant professor at the University of Manitoba medical school, said the compound, MTT, which contains manganese and is banned in the U.S., could be doing Canadians more harm than good.

MINERAL'S EFFECTS: The author of a National Research Council report on manganese in the environment cited several examples of the effects of the mineral:

- Three California studies have shown high levels of manganese in hair samples obtained from murderers.
- Violent behavior is common among Australian aborigines who live on an island that is the site of the world's largest manganese mine. Donaldson recently was a consultant in that country, investigating the effects of the mining on the health and behavior of aborigines.
- Animal studies conducted by Donaldson show moderate doses of manganese disrupt the levels of sex hormones, including testosterone, and cause impotence.
- In Chile, manganese miners often suffer acute but temporary psychiatric conditions causing compulsive acts and hallucinations resembling schizophrenia. Months later, they develop symptoms similar to Parkinson's disease — rigidity of movement, tremors and fixed gaze.

BAN URGED: Last month, Lambton Middlesex MP Ralph Ferguson tabled a private member's bill in the Commons urging the additive be banned in Canada. He proposed that ethanol, made from grain, be used in its place.

In London, radio stations CJBK and CJBX-FM have collected about 2,000 names on a petition supporting Ferguson's bill. Program director Ian McCallum said Monday the results "far exceeded our expectations" and the idea has been picked up by a radio station in Calgary.

"People are seeing more and more things they can do at an individual level," McCallum said of the response. "The worst thing is apathy — 'I'm only one person, I can't do anything about it so I won't bother.' "

General Motors Corp. and Mercedes-Benz Canada have asked the Canadian government to ban MMT.

Canada

Gas additive linked to diseases

TORONTO (CP) — A compound added to gasoline in Canada to control pollution may be linked to violent behavior, impotence and symptoms similar to Parkinson's disease, a scientist warns.

John Donaldson, a neurological biochemist and assistant professor at the University of Manitoba medical school, told delegates to a recent conference that the compound — which contains manganese and is banned in the United States — could be doing Canadians more harm than good.

The author of a National Research Council report on manganese in the environment cited several examples of the effects of the mineral:

• Three California studies have shown high levels of manganese in hair samples obtained from murderers.

• Violent behavior is common among Australian aborigines who live on an island that is the site of the world's largest manganese mine. Donaldson recently was a consultant in that country, investigating the effects of the mining on the health and behavior of aborigines.

• Animal studies conducted by Donaldson show moderate doses of manganese disrupt the levels of sex hormones, including testosterone, and cause impotence.

• In Chile, manganese miners often suffer acute but temporary psychiatric conditions causing compulsive acts and hallucinations resembling schizophrenia. Months later, they develop symptoms similar to Parkinson's disease — rigidity of movement, tremors and fixed gaze.

He told the conference that the gasoline additive — methylcyclopentadienyl manganese tricarbonyl, or MMT — has been banned in the U.S. since the early 1970s but has been widely used in Canada for more than 10 years.

Last month, Ontario Tory MP Ralph Ferguson tabled a private member's bill in the Commons urging the additive be banned in Canada. He proposed that ethanol, made from grain, be used in its place.

General Motors Corp. and Mercedes-Benz Canada have asked the Canadian government to ban MMT.

B2

TOR STAR 12-11-90

Gasoline additive can harm brain scientist warns

By Marilyn Dunlop
TORONTO STAR

A compound added to gasoline in Canada to control pollution is toxic to the brain and may be linked to violent behavior, a scientist warns.

It may also be linked to impotence, acceleration of aging of the brain and symptoms similar to those of Parkinson's disease, says John Donaldson.

Donaldson, a neurological biochemist with BioTox Research Services and an assistant professor at the University of Manitoba medical school, said the metal, manganese, is a component of the gasoline additive used to reduce automobile emissions — and it could be doing Canadians more harm than good.

Canadians who work in car battery and steel-making plants are exposed to the highest levels of manganese, Donaldson said, adding that the metal is inhaled and goes first to the lungs and then to the brain.

He cited several examples of its effects:

- ☐ Three California studies have shown high levels of manganese in hair samples obtained from murderers.
- ☐ Violent behavior is common among Aborigines who live on an Australian island that is the site of the world's largest manganese mine.
- ☐ In Chile, manganese miners often suffer acute but temporary psychiatric conditions causing compulsive acts and hallucinations resembling schizophrenia. Months later, they develop symptoms similar to Parkinson's disease: rigidity of movement, tremors and fixed gaze.

The gasoline additive, MMT (methylcyclopentadienyl manganese tricarbonyl), has been banned in the United States since the early 1970s but it has been widely used in Canada for more than 10 years.

Speaking recently at a conference at Mount Sinai Hospital on the impact of neurotoxins on public health, Donaldson said manganese poisoning has long been known to cause Parkinson-like symptoms. Parkinson's patients have a shortage of the brain chemical, dopamine, he said, adding manganese destroys dopamine.

In a normal brain, dopamine declines with age as the cells that produce it are lost, but a healthy 50-year-old still has 50 per cent of the original supply of dopamine-producing cells. Symptoms of Parkinson's show up when 75 per cent of those cells are lost. Donaldson suggested that exposure to manganese may speed up the normal rate of attrition of the cells.

Last month, Ralph Ferguson, Progressive Conservative MP for Lampton-Middlesex, tabled a private member's bill in the House of Commons urging that MMT be banned in Canada and that ethanol, made from grain, be used in its place.

— Liberal MP

May 4, 1990

ECOTOXINS

Aboriginal medical puzzle

Kingston-area researchers study effects of manganese in Australia

By JEFF OUTHIT
Whig-Standard Staff Writer

Two Kingston-area health researchers are hoping to save the lives of a remote group of Australian aborigines as they grapple with a distant medical puzzle.

The natives live on an island off the northern tip of Australia called Groote Eylandt. Some of them have been afflicted with a rare brain disease that makes their muscles stiff and causes them to stagger, lose their voice and sometimes die.

Australian health researchers believe the afflicted natives are slowly being poisoned to death by a metal called manganese that is commercially mined on the island. And they have asked two Kingston researchers to help them figure out how and why.

Strengthens steel

"Australia is looking to Canada for help because of their current work in manganese ecotoxins," Australian psychiatrist Dr. John Cawte said during a recent visit to Kingston.

Manganese is a metal used by industry to strengthen steel. It is also used in car batteries and as an anti-knock and octane-boosting ingredient in Canadian gasoline now that lead has been phased out.

Like a host of other metals, manganese is also essential to human health. Humans need a tiny amount of the metal in their bodies to digest their food properly.

Health researchers have long considered manganese to be harmless as long as humans aren't overexposed. Federal Canadian health officials believe people are not at risk from exposure to manganese in the natural environment.

Mindless violence

"Although it can be an occupational risk, environmental levels are 1,000 times lower than these," said Grace Wood, who sets contamination guidelines for Health and Welfare Canada. "Many things are toxic at higher levels, and perfectly innocuous at lower levels."

But some research has suggested that the metal may be responsible for a degenerative neurological disease similar to Parkinson's disease that affects muscle control. And other research suggests that exposure to the metal may cause some people to become agitated and excited, perhaps to the point of inciting them to mindless violence.

Kingston researcher Dr. John Donaldson has become convinced that, even in small amounts, manganese can be a risk to human health.

CE

'Powerful neurotoxin'

"The origin of the word manganese comes from the ancient Greek meaning cult sinister, voodoo. That describes it very well — it's lik Jekyll and Hyde element," said the former medical and pharmacology professor wh now runs his own Sharbot Lake medical research labor tory on toxic substances.

"For many years, I consic ered manganese to be relatively innocuous. Now I see as a powerful neurotoxin."

Besides writing reports tc warn the Canadian govern ment about the dangers c manganese exposure, Dr. D naldson has been working with Dr. Cawte to develop a theory about how manganc may be poisoning the native of Groote Eylandt.

Dr. Donaldson believes t certain people who inhale manganese through the air

Please see METAL, Page 2

Metal

(Continued from Page 1)

may risk brain disease, reproductive failure, and behavioral problems. (Manganese ingested in food is not absorbed as much by the human body.)

A recent Soviet study, Dr. Donaldson said, suggested that the wives of Soviet manganese miners are more likely to suffer stillbirths and miscarriages. Studies of the metal's behavorial effects, he said, have focused on the "manganese madness" that is believed to cause bursts of crazed, foolish behavior among a small percentage of Chilean manganese miners.

Australian prison statistics show that the Groote Eylandt natives, who live on top of a huge natural manganese outcrop, commit more acts of violence than any other aboriginal group.

A more recent California study, Dr. Donaldson said, found that violent prisoners are more likely to store manganese in their bodies than non-violent criminals, raising speculation that their violent behavior is linked to their inability to flush out the metal.

Dr. Donaldson and Dr. Cawte have recently enlisted the help of Queen's University researcher Dr. Patrick MacLeod to unlock one aspect of the manganese puzzle.

Strange illness

Dr. MacLeod, a medical geneticist, studies hereditary diseases and is not an expert on manganese. But he became intrigued when he learned that only some clans of the Groote Eylandt natives are afflicted with the island's strange illness.

The three researchers are working on an unproven theory that some humans, because of the genes they inherit from their parents, are more susceptible than others to diseases that may be caused by environmental agents like diets, pollution, and geography.

"Each one has his poison, and what is your poison? Not all poisons are the same," Dr. MacLeod said in an interview. "For my two cents worth, I think there's a genetic susceptibility."

Dr. MacLeod is developing a test that will be used to determine whether the natives of Groote Eylandt have a fast or a slow metabolism, which is the rate at which a person turns food into energy.

If the test — Dr. MacLeod calls his effort a scientific "fishing expedition" — suggests a strong link between metabolism and the Groote Eylandt affliction, researchers may be on their way to determining which natives are most at risk of developing the brain disease.

Pick up sufferers

"That could be of great help," Dr. Cawte said, "because you could pick up on the children who are vulnerable, you could pick up the sufferers and remove them from the site of the ecotoxins."

Along with his work on behalf of the Groote Eylandt natives, Dr. Donaldson has recently written a report for the National Research Council calling for more study of manganese and its health effects in this country.

He fears that Canadians may be at risk from breathing a manganese compound known as MMT that is now used in gasoline to replace lead (the compound is banned in the United States because the Americans believe it interferes with pollution control devices).

"This will become an important use of manganese," he said, "and will certainly increase the amount of manganese in the environment."

Those most at risk from manganese poisoning, Dr. Donaldson believes, are pregnant women and young children whose bodies have not developed the maturity to flush the metal out of their bodies. If children store enough manganese while young, he said, they may suffer serious brain diseases like Parkinson's disease later on in life as the metal causes their brain to age faster.

Other health professionals are also concerned about the use of manganese in gasoline. The Canadian Neurological Coalition called on the government to study the issue a few years back.

"We have to approach these things with caution, I understand, but still it seems to be ringing some alarm bells that we should be doing more research," said Barbara McElgunn, president of the coalition of brain disease experts.

Her coalition is not calling on the government to ban MMT, she said, but "they should be looking at perhaps more research on developing alternative fuel additives."

Mrs. McElgunn said she supports Dr. Donaldson's theory that environmental pollutants or agents like manganese may trigger premature aging and cause diseases like Parkinson's and Alzheimer's, "although it's certainly an area that needs more research."

And she's concerned that researchers have not focused on the difference between breathing manganese and eating it. "I think inhaled manganese is a different kettle of fish, and seems to have more toxicity than ingested manganese."

Not ignoring warnings

Government health experts are familiar with Dr. Donaldson's "excellent work" and are not ignoring his warnings about manganese, health and welfare's Mrs. Wood said.

But government studies suggest that MMT in gasoline provides "less than one per cent" of a person's total daily intake of manganese, she said. Even if that is inhaled, she added, "it's not a problem."

Mrs. Wood said she is intrigued by the theory that some brain diseases may in fact be premature aging brought on by childhood exposure to elements in the environment. But "that's a theory that's not proven at all," she said. "It still needs work."

The Canadian government would like to fund more studies on the health effects of manganese, Mrs. Wood said. "The government will follow this up. It just takes time."

C1

MERCEDES-BENZ

Additives in Gasoline Fuel

The main prerequisite for the introduction of the catalytic converter was the elimination of lead in gasoline. There is evidence that also the use of MMT in gasoline deteriorates the performance of catalysts as well as oxygen sensors.

Oxygen sensor controlled three-way catalysts are known at present as the most effective method for controlling emissions from gasoline engines. In order to maintain the optimal emission control efficiency for as long as possible, it is absolutely necessary to eliminate MMT from the fuel. This measure, which would be a prerequisite for meeting the proposed emission standards over the useful life of the vehicle, would additionally have the positive effect of improving emission durability of the older catalyst equipped vehicles in the field.

EMISSION LEVELS

Proposed NOx Standard

The proposed standard for NOx is listed as 0.40 gpm. This level is 11% more stringent than the already difficult 0.4 gpm NOx standard for California. We believe the intention of the proposed regulation is not to adopt more stringent standards than California but rather to be equal to them. Therefore, the proposal should be modified from 0.40 to 0.4 gpm NOx.

Proposed CO2 Standards

The proposed CO2 standard of 320 gpm (and later of 250 gpm) is not attainable with the body size, weight and optional equipment of today's Mercedes-Benz gasoline-fueled passenger cars.

In order to reduce CO2 emissions to the proposed levels, significant weight reductions would be necessary. This would not only eliminate many options (options which may contribute to passenger convenience and comfort) but could also effect vehicle safety. For instance, based on physical principles confirmed by DOT statistical analyses, the mere existence of an increase in vehicle inertia will result in a relative increase in vehicle crash safety (see NHTSA ESV Report #89-2B-O-005). In addition, features which improve the active and passive safety of our vehicles may be subject to deletion if certification is otherwise not possible. From a standpoint of safety, such a development must be counterproductive. The long term goal of cleaning up the air (in order to reduce the health risk to humans) should not be considered apart from the concerns for vehicle safety.

Mercedes-Benz therefore requests that the CO2 standard of 320 (250) gpm be reconsidered and adjusted to levels which are stringent enough to further improve air quality, but which also can be achieved without unreasonable risk to vehicle safety.

C10

MERCEDES-BENZ

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September 12, 1989

Mr. L. E. Hrobelsky
Chief, Energy and Emissions Engineering
Road Safety and Motor Vehicle Regulation
Transport Canada
Ottawa, Ontario, Canada
K1A ON5

Subject: Comments on the Federal Action Plan of Canada to Reduce Emissions

Dear Mr. Hrobelsky:

Mercedes-Benz of North America on behalf of Mercedes-Benz AG would like to provide the following comments on the Federal Action Plan of Canada to reduce emissions from motor fuels and mobile sources.

MOTOR FUELS

Vapor Pressure of Gasoline

MBAG fully supports limiting the vapor pressure of gasoline during the summer months. The action would not only reduce evaporative emissions during vehicle fueling and vehicle operation, but would also contribute to air pollution reduction during the refining process, fuel transport and storage.

Research performed by automobile manufacturers, as well as various institutions, has clearly demonstrated that the technical and safety concerns for a properly functioning on-board vapor control system increase in direct proportion to the amount of fuel vapors that are stored. We are not only concerned for the technical and safety aspects, but the dimensional and cost considerations of the total emission control system are directly linked with the amount of fuel vapors that must be stored.

The reduction of the fuel vapor pressure is therefore a prerequisite to the development of a safe and effective evaporative emission control system.

C14

MERCEDES-BENZ

Emission Standards in View of LDDV's

Based on the superior thermodynamic efficiency of the diesel combustion process, the diesel engine is a power source which comes close to the proposed CO2 standard of 320 gpm, without necessitating significant changes in vehicle weight.

However, the proposed LDV emission standards do not distinguish between gasoline and diesel powered vehicles.

Based on actual results of our ongoing research and development work on diesel engines, and based on our latest experiences with further refined trap oxydizer technology, the following emission levels seem to be achievable:

- HC = 0.25 gpm
- CO = 3.4
- NOx = 0.7
- PM = 0.15

Compliance with these emission levels would necessitate improvements in diesel fuel quality, such as:

1) the total elimination of the sulphur content (or at least limited to 0.05% by weight);

2) limitation of aromatic hydrocarbon content; and

3) improvement of the Cetane number.

In many durability runs and in several in-field surveillance test programs, the diesel engine has clearly demonstrated its emission stability at low levels throughout the whole vehicle life.

Evaporative emissions, which are a major problem for gasoline cars, do not exist for diesel vehicles.

Taking into account the obvious advantages of the diesel engine and considering its potential for better fuel economy/lower CO2 emissions (compared with gasoline and other alternative fueled cars) the installation of a separate set of diesel standards would be fully justified.

Mercedes-Benz AG requests that the foregoing comments be taken into consideration in modifying the proposed regulation.

Thank you for the opportunity to provide our comments on this very important matter.

Sincerely,

William Kurtz
Manager, Emission Control

WK:JB:br

C1

1908 Colonel Sam Drive
OSHAWA, Ontario
L1H 8P7

General Motors of Canada Limited

October 3, 1989

Madame Michelin Desjardins-Chase
Assistant Deputy Minister
Transport Canada
344 Slater Street
Canada Building
Ottawa, Ontario
K1A 0N5

Dear Madame Desjardins-Chase:

Subject: Comments On Canadian Plan To Identify And Assess Emission Reduction Opportunities From Transportation

Enclosed are General Motors' comments which were shared at the public hearings in Ottawa on September 20th. We look forward to having other opportunities on which to elaborate on this extremely important issue.

NOx Ozone Trade-off

The Canadian approach to environmental protection is based on several key principles including the use of best available technology economically achievable (BATEA) and pollution control actions aimed at achieving environmental quality levels. In most cases, actions taken under these two principles will not conflict with one another. However, the scientific fact that NOx reductions can increase ozone concentrations at some times and places means that the lowest NOx emission rate may be counter productive to achieving Canada's ozone air quality objective.

Since ozone is such a complex pollutant, the only way to know whether the proposed NOx emission standards will provide a net benefit for Canada is to carry out state-of-the-art modelling. We would strongly recommend that the analysis of the plan to be undertaken by the Canadian government include a specific assessment of the impact of motor vehicle NOx emission reductions on ozone levels in both urban and rural Canadian locations.

Since the interest in California standards has been influenced by discussions with the NESCAUM states, I am attaching a write-up from GM Research that addresses the technical case for the relative benefits of HC and NOx controls in the Northeast U.S.

Emission Projections

The plan acknowledges the large uncertainty in current emission inventories and indicates that improvements in inventories and forecasts will be made as part of the plan. GM of Canada looks forward to working with the government to improve the inventory and forecasts. As we have had substantial experience with MOBILE4, the U.S. EPA Model, if sufficient Canadian - specific data is available, we can help provide improved forecasts. Since Canada introduced stringent emission standards only recently, we should be able to demonstrate substantial reductions in projected emissions from the current regulatory program.

Proposed Light-Duty Vehicle Emission Levels

The emission reduction possibilities in the mid-1990's were supposedly identified by applying BATEA, where BATEA is defined as a technology that has been commercially demonstrated somewhere in the world and which can be applied without causing unbearable economic hardship to the source of emission.

In the U.S., a phase-in of the .25 grams/mile hydrocarbon standard is included in the Bush Administration Clean Air Act proposals and is being phased-in in California. While General Motors has supported the key elements of the Bush proposal in the U.S., it must be noted that the .25 HC standard is technology-forcing particularly in conjunction with reductions in other emissions and has not been commercially demonstrated. To ensure that a new Canadian standard is implemented effectively with the lowest recall exposure for consumers, we believe that Canada should adopt a similar phased-in approach. Because of the harmonized nature of the North American automotive industry, the relatively low percentage of emissions yet to be reduced, the engineering challenges involved, and the potential cost impact on consumers, we are very concerned that Canadian regulators might act before the U.S. federal 49 state standards are finalized. Unless scientific or technological reasons dictate otherwise, we strongly advocate that the Canadian government adopt the new U.S. 49 state standard.

Particulate & Formaldehyde Standards

Table 8 in the plan includes proposed particulate and formaldehyde standards. It should be clearly noted that the particulate standard applies only to diesel-fueled vehicles and the formaldehyde standard applies only to methanol-fueled vehicles.

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Proposed CO_2 Emission Standards

Table 8 also includes a CO_2 emission standard. Since CO_2 emissions are linearly related to fuel economy, this is in essence a fuel economy standard. The 320 g/mi proposal is roughly equivalent to 27.7 miles per U.S. gallon; the 2005 proposal of 250 g/mi is roughly equivalent to 35.6 miles per U.S. gallon. In order to maintain transparency for the public who understand 1/100 km terminology well, we believe that it is important to use this measurement technique in the CO_2 issue. We believe that the current Canadian voluntary fuel economy program is working well, and discussion should center on how this voluntary program might best serve the growing concern over CO_2 emissions. Because we are a full line automotive manufacturer, we believe it is important to maintain the concept of fleet averaging so as not to favour importers over the domestic manufacturing base.

Vehicle Refueling Emissions

The Canadian plan includes consideration of on-board vehicle refueling controls as well as Stage II controls. Stage II controls are the obvious choice if refueling emissions are to be controlled. Stage II is a commercially demonstrated technology that is in its fourth generation of development; and Stage II can be applied in specific geographic areas where it will cost-effectively reduce ozone. On-board systems have not been commercially demonstrated and still have serious safety concerns.

Fuel Regulations

We strongly support the activities underway in the U.S. to reformulate gasoline to reduce the amount and reactivity of emissions and reduce air toxics. In Canada, we encourage immediate control of RVP in the summer months, elimination of MMT, and we should continue to monitor other fuel developments in the U.S.

Conclusion

General Motors is investing millions of dollars in developing new products and processes to make a positive contribution to the environment. In Canada, for example, we have lead research and development responsibility within the General Motors organization for methanol vehicles, and we have pioneered the world's first large-scale waterborne base coat/clear coat paint complex at our Oshawa Truck Plant, which substantially reduces volatile organic compound air emissions. These are only two of the many important initiatives we

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now have underway throughout our organization to meet our common goal of lower emissions and cleaner air. We hope that by working together with your Government we can develop and implement appropriate new vehicle emission standards for Canada which are scientifically based, economically and technologically feasible, and make a solid contribution to a cleaner Canada.

Yours truly,

Karen L. Low

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Manager
Environmental Activities
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/jf

cc: Mr. E. Crupi
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